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HAND HELD SAW MILL

- [0001] Cross-references to related applications:
This application claims priority to U.S. Provisional Patent
5 Application, S/N 60/117,692, filed January 29, 1999.
- [0002] Reference to microfiche appendix: not applicable.
- [0003] Statement Regarding Federally Sponsored Research or Development: not applicable.

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Background of the Invention

1. Field of Invention

- [0004] The present invention relates generally to a workpiece carrier which, while suitable for other uses, is especially useful in connection with cutting boards of a desired thickness with a conventional band saw of the type having a table top work surface provided with a miter guide slot extending parallel to the direction of cut of the saw blade such as commonly found in home workshops and certain commercial environments.

- [0005] More particularly, the invention relates to a workpiece carrier adapted for use with such power equipment having a cutting, shaping or abrasive tool, and which provides for both sliding movement of the carrier on the table and the workpiece through cutting engagement with the tool, and positioning of the workpiece transversely thereto for adjusting the depth of cut into the workpiece.

2. Description of Prior Art

- [0006] Cabinetmakers, hobbyists and other woodworkers use a variety of board lumber sizes for the fabrication of various articles, and there are times when a desired board is of a non-standard thickness or material.

Locating such non-standard boards can be difficult, and if located, they may be relatively expensive.

[0007] One alternative to searching for or paying relatively high prices for a non-standard board is to cut 5 the desired board from a standard size commercially available board. However, this can sometimes be a difficult task, due in part, because there is no prior holder that both conveniently holds the board to be cut and is easily adjustable to establish the thickness of the desired non-10 standard board.

[0008] In other instances, a suitable standard board may not be available from which the desired non-standard board can be cut. In such instances, particularly where the board is to be made from a non-standard material, 15 it would be advantageous to be able to cut the desired board from a log or unfinished chunk of the non-standard material. Again, however, there is no suitable prior holder available to both securely hold a non-standard sized or shaped article and provide adjustment to obtain the thickness of the 20 desired board.

[0009] Certain prior miter-type devices may be used for cutting a board from a workpiece. However, such devices do not provide for secure connection to the workpiece, and they do not provide for ease of precision adjustment of the 25 workpiece transverse to the saw blade. Instead, use of such devices requires the operator to hold the workpiece in position against a guide, and the guide must be manually slid to the desired position prior to locking into place.

[0010] Thus, to enable the cutting of boards of a 30 non-standard thickness, from a non-standard material, or from a non-standard size or shaped workpiece, and thereby promote the availability and reduce the cost of obtaining

non-standard boards, there is a need for a workpiece holder that is suitable for securely holding both standard boards and non-standard articles, and that is also easily adjustable for establishing the thickness of the desired board.

[0011] Safe operation of saws and other power woodworking equipment is always of concern. During more recent times, substantial effort has been made to provide guards, safety switches and other safety devices for such power equipment. However, there has been little improvement during this time in carriers for securely holding a workpiece during the cutting of a board therefrom, particularly as it relates to the cutting of boards with equipment of the type typically found in home workshops and smaller commercial environments.

[0012] For example, cutting a board of a non-standard thickness from a thicker standard board is typically accomplished by locating a fence parallel to the direction of cut of the saw blade, and then pushing the standard sized board through the saw blade while holding it against the fence to obtain the desired thickness in the resulting board. However, such techniques are generally dangerous since the board is not securely held in position against the fence, and particularly as the downstream end of the board is pushed through cutting engagement with the saw blade. The dangers associated with such techniques can be reduced if two people are involved in the ripping operation, with one person attending to the upstream end of the board and the other person pushing the board through the saw. Such techniques also tend to result in boards that are not a precise constant thickness, again because the boards are not

securely held parallel to the cutting direction of the saw blade during cutting engagement therewith.

[0013] Thus, there is also need for a workpiece holder that promotes safe operation of a power band saw and other power table-type equipment by securely holding a workpiece from which a board of a desired thickness can be cut, that promotes precision cutting by securing the workpiece in parallel relation to the saw blade during the cutting of the desired board, and that can be safely and easily operated by one person.

Summary of the Invention

[0014] The general aim of the present invention is to provide a new and improved workpiece carrier suitable for use with band saws of the type having a flat work table provided with a miter guide slot extending parallel to the direction of cut of the saw blade, and adapted to securely hold both standard and non-standard size and shape workpieces to enable the cutting of precision boards of a desired thickness therefrom.

[0015] A detailed objective is to achieve the foregoing by providing a carrier that includes provision for sliding the workpiece on the table along a path parallel to the cut of the saw blade, and for easily adjusting the location of the workpiece transversely thereto to establish the thickness of the board to be cut from the workpiece.

[0016] These and other objectives and advantages of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

[0017] Briefly, a carrier according to the invention includes (i) a base provided with a guide bar

extending downwardly therefrom and slidably received in the miter guide slot of the saw work table, a manually graspable handle to enable sliding the carrier along the guide slot, and a slide track extending transverse to the guide bar,

5 (ii) a holder adapted for secure connection of the workpiece and slidably positioned in the track for translation transverse to the guide bar, and (iii) a manually operable drive mechanism operably connected between the base and the holder to enable controlled adjustment of the transverse

10 position of the holder in the track and thus transverse position of the workpiece with respect to the blade.

[0018] During use, the workpiece is securely connected to the holder and the guide bar is slidably positioned into the guide slot of the work table. Rotation 15 of the drive screw moves the holder on the base transversely to the direction of cut of the saw to establish the depth of the cut into the workpiece. The use of a threaded screw drive for adjusting the workpiece allows for an infinite range of thickness to be cut from the workpiece. After 20 adjustment of the drive screw, the desired cut is made by sliding the carrier along the guide slot, causing the workpiece to pass through cutting engagement with the saw blade.

[0019] With this arrangement, the carrier of the 25 present invention enables precision cuts through both standard and non-standard workpieces, including relatively thick workpieces such as a log, a block of steel, a block of plastic, or other materials which have properties that allow cutting by a saw blade. The carrier also enables a single 30 individual to position, hold and maneuver the workpiece on the working surface of the saw in a way that allows for precise, predictable and safe cutting.

Brief Description of the Drawings

[0020] Figure 1 is a perspective view of a new and improved workpiece carrier incorporating the unique aspects 5 of the present invention.

[0021] Figure 2 is an exploded perspective view of the carrier of Figure 1.

[0022] Figure 2A is an enlarged fragmentary exploded perspective view of certain parts shown in Figure 10 2.

~~Figures 3-5 are back, side and top views, respectively of the carrier of Figure 1.~~

[0023] Figure 3 is a back view of the carrier of Figure 1.

15 [0024] Figure 4 is a side view of the carrier of Figure 1.

[0025] Figure 5 is a top view of the carrier of Figure 1.

20 [0026] Figure 6 is a view of the carrier of Figure 1 as used in connection with a band saw.

[0027] Reference numerals shown in the drawings correspond to the following items:

- 10 - carrier
- 12 - saw
- 14 - saw table
- 16 - guide slot in saw table
- 18 - saw blade
- 20 - workpiece in form of log
- 22 - board being cut from log
- 24 - base plate
- 25 - front edge of base plate

26 - side retaining members
28 - fasteners
30 - guide bar
32 - handles
34 - holder
36 - slide member
38 - mounting plate
40 - tracks
42 - rails
44 - apertures
46 - threaded drive screw
48 - control arm
50 - knobhandle
52 - lock nut
54 - mounting nut

[0028] While the invention is susceptible of various modifications and alternative constructions, a certain illustrated embodiment has been shown in the drawings and will be described below in detail. It should 5 be understood, however, that there is no intention to limit the invention to the specific form disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention.

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Detailed Description of the Invention

[0029] For purposes of illustration, the present invention is shown in the drawings as embodied in a workpiece carrier 10 (FIG. 1) in use with a band saw 12 15 (Figure 6) having a flat table 14 provided with a meter guide slot 16 that runs parallel to the direction of cut of

the saw blade 18, and cutting a board 22 from a workpiece 20 in the form of a log.

[0030] In accordance with the invention, the carrier 10 is adapted for securely holding both standard and non-standard workpieces, for sliding movement of the workpiece on the table 14 along a path parallel to the direction of cut of the saw blade 18, and for positioning of the workpiece transversely to said parallel path to adjust the depth of cut of the saw blade into the workpiece.

[0031] In carrying out the invention, the carrier 10 includes a base plate 24 having a front edge 25 and top and bottom surfaces extending rearwardly from the front edge 25 for slidably resting on the saw table 14, and a guide bar 30 projecting downwardly from the base plate and sized to be snugly but slidably received into the guide slot 16 for sliding movement of the carrier along said parallel path. Manual sliding of the carrier along this path is enabled by manually graspable handles 32 that are connected in fixed relation to the base plate with respect to said parallel path.

[0032] Threaded fasteners 28 are generally shown for connecting the guide bar 30 to the base plate 24, as well as connecting certain other components together as shown in the drawings and discussed below. It will be understood, however, that other fastening techniques may alternately be used for connecting such parts together, and that certain of the combined components may alternately be formed integral with one another.

[0033] In further carrying out the invention, the carrier 10 includes a workpiece holder 34 having a slide member 36 slidably connected to the base plate 24, for sliding movement transverse to the direction of the cut of

the saw blade 18, toward and away from the front of the base plate, between front and back position such as indicated in dashed lines in Figure 5 and identified with the reference letters "F" and "B" respectively, and a mounting plate 38 extending upwardly and longitudinally (i.e., generally parallel to the guide bar 30) from the end portion of the slide member proximate the saw blade.

5 [0034] In the embodiment shown, the slide member 36 is slidably retained by a pair of side retaining members 26 connected to the base plate 24. In this instance, the side retaining members 26 are formed with inwardly extending lips spaced from the base plate to define slots 40 sized to slidably receive complimentary shaped rails 42 formed along the sides of the slide member.

10 15 [0035] The mounting plate is provided with a series of apertures 44 sized to receive fastening devices, such as the screws 28a shown, or clamps or vises or other fastening apparatus, for releasably securing a workpiece thereto.

20 25 [0036] Transverse movement of the holder 34 toward and away from the saw blade is effected with a manually operable threaded drive screw 46 that is mounted for rotation relative to the base plate 24. In the embodiment shown, the drive screw is threaded through a mounting nut 54 that is connected to a control arm 4850 which is in turn connected in fixed relation to the base plate 24 outwardly of the slide member 36 via the side retaining members 26. The drive screw is provided with a turning knobhandle 50 at its free end, is threaded through the fixed control arm, and is rotatably affixed to the mounting plate 38 at its opposite end such that turning the knobhandle and drive screw in one direction adjusts the position of the holder along the slots 40 either toward or away from the saw blade,

and turning the knob and drive screw in the opposite direction adjusts the position of the holder along the slots 40 in the opposite direction. A manually operable locking nut 52 is provided on the drive screw, for engagement with 5 the control arm, to lock the drive screw in position after manual adjustment thereof.

[0037] In the embodiment shown, the handles 32 are connected between the slide member 36 and the mounting plate 38 such that they are held fixed to the base plate 24 with 10 respect said path parallel to the cut of the saw blade 18. In other words, although the handles slide in the base plate toward and away from the cutting tool with the slide member 36 and the mounting plate 24, the handles do not move 15 transversely thereto with respect to the base plate. As a result, the handles enable manual sliding of the entire carrier along the guide slot 16 in the work table 14, and thus along a path parallel to the normal direction of the cut of the saw blade.

[0038] With the foregoing arrangement, a workpiece 20 such as the log 20 is secured to the holder for transverse movement therewith such as against the forward face of the mounting plate with fasteners extending through the apertures 44 and screwed into the back side of the workpiece. If not previously in position on the table, the 25 carrier and attached workpiece are then positioned on the work table 14, with the guide bar 30 slidably positioned in the guide slot 16 of the work table.

[0039] The transverse position of the workpiece 20, i.e., the position of the workpiece relative to the saw 30 blade 18, is adjusted by manual rotation of the drive screw 46 which is then locked into place with the locking nut 52. This establishes the depth cut of the saw blade relative to

the mounting plate, and thus, the thickness of the board to be cut from the workpiece. After the desired adjustments are made, the handles 32 are grasped and the carrier and workpiece are moved manually across the work table (such as 5 from left to right with the saw shown) along a path parallel to the direction of cut of the saw blade, the carrier being guided by the sliding relationship between the guide bar and the miter guide slot of the work table. This movement will cut a board or stock of the desired thickness from the outer 10 edge portion of the workpiece. After each cut, the carrier and workpiece are returned to a location spaced ahead of the saw blade (i.e., slid to the left of the blade shown), and the transverse position of the holder is manually re-adjusted forwardly to establish the depth of the next cut, 15 i.e., the thickness of the next board to be cut from the workpiece.

[0040] To avoid damage to or dulling of the teeth of the saw blade, the fasteners extending through openings 44 and used to attach the workpiece to the mounting plate 38 20 are preferably of a length that they extend into the workpiece a distance less than the thickness of the last cut from the workpiece.

[0041] As will be evident, the carrier of the present invention is also suitable for use with other power 25 cutting tools such as table sanders, table routers, table circular saws and other power saws and cutting and shaping apparatus provided with a work table and associated miter guide slot, and a cutting or abrasive band or blade or shaping or sanding surface operatively associated therewith. 30 The carrier is therefore also suitable for other uses such as for sanding, trimming and shaping the edges of a workpiece.

[0042] From the foregoing, it will be apparent that the present invention brings to the art a new workpiece carrier suitable for holding workpieces of both standard and non-standard sizes and shapes, and which, by virtue of
5 providing for controlled sliding along the work table guide slot, and adjustment of the workpiece transversely thereto, uniquely adapted to assist in cutting boards of a desired thickness from the workpiece, or otherwise permitting controlled cutting and shaping of the edge portions of the
10 workpiece.